



Seed Sterilization Protocol

Alfalfa Seed Sanitization Prior to Sprouting Using Sodium Hypochlorite

PREPARED BY:

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Objective

The Clorox Company has been asked to register a disinfectant to meet the sprouts industry's need for an approved seed treatment method as required by FSMA regulations beginning in 2017. The goal of the following protocol is to provide an effective seed treatment method to be adopted by the sprouts industry. This method focuses on seed treatment prior to the sprouting process to achieve a ≥ 3 log reduction of bacteria of public health significance using Clorox liquid bleach as a sanitization agent.

Scope

The following protocol provides a scientifically valid method that can be used to treat seeds immediately prior to sprouting at a manufacturing facility to meet FDA CFR requirement §112.142. This fulfillment requires ensuring that the treatment procedure is correctly followed including, as appropriate:

- treatment active level
- appropriate volume of solution to seed
- treatment contact time
- treatment temperature
- other measures specific to the manufacturer's operation that may pose foreseeable hazards to the efficacy of the seed treatment process

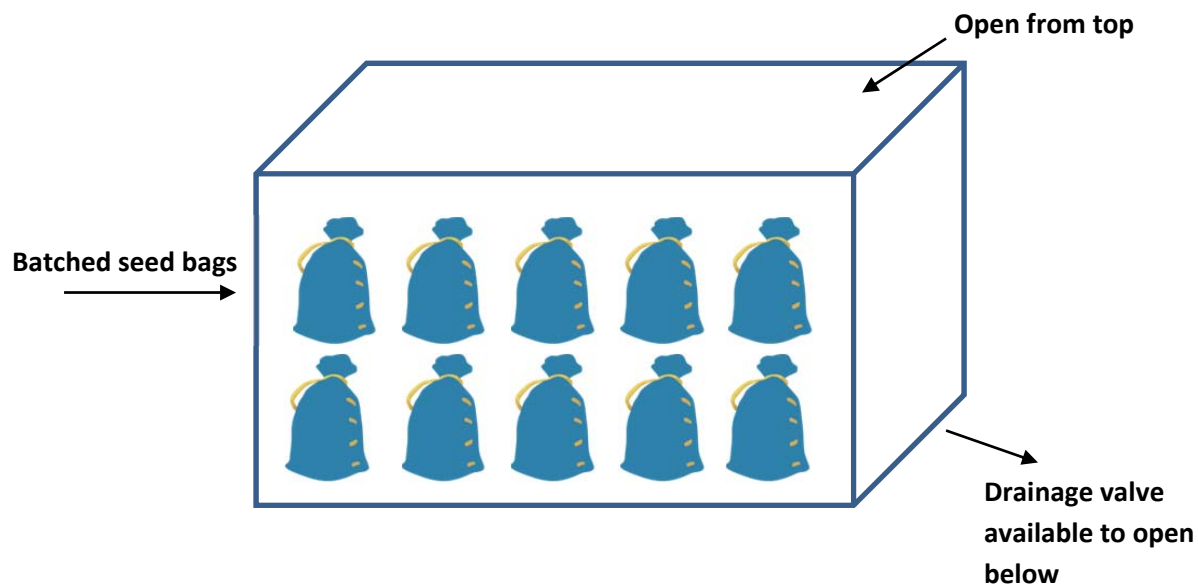
Seed Treatment Procedure

1. Pre-germination Seed Soak

Soaking results in swelling and softening of the seed coat, promoting the sprouting process. Pre-germination seed soaking is not required for this treatment process. If seed soaking practices are used, it is recommended that all materials are cleaned and sanitized, in addition to ensuring that the water used meets the microbial quality criterion in § 112.44(a).

2. Seed Batching

Seed should be batched in similar weight portions using suitable materials such as mesh bags, bins or trays (following proper cleaning and sanitizing practices). The batching material chosen by the sprouting manufacturer should ensure that proper fluid access to and drainage from the seed batches is sufficient. The following schematic provides an example of seed batching using mesh food bags contained within large bin to carry out the process:



3. Preparation of Treatment Solution

Clorox liquid bleach should be prepared to a final concentration level of 19,000 ppm in a volume of water sufficient to fully submerge all batched seed. It is recommended that the actual available chlorine level is obtained by titration just before the treatment procedure.

4. Seed Treatment and Post-rinse

Seed batches should be immersed into the treatment solution and mixed throughout the contact time (20 minutes) either by manual “dunking” of the mesh seed bags or rotating the bins/trays. At the end of the contact time, seeds should be rinsed with pure water. The rinse step is to be carried out immediately after the treatment step, with the seeds batched and fully immersed in a volume water sufficient to completely submerge the seed. These steps should be carried at room temperature.

5. Quality Control Measures

It is recommended that the sprouting facility take appropriate measures to ensure that the seed treatment process is carried out as described and using all materials that meet the microbial quality criterion (i.e. water quality). Additionally, the final concentration of the available chlorine level and analysis of rinse water from the treatment step should be routinely carried out to ensure the treatment process is effective.